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CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			EXAMINER EDGAR, RICHARD A	
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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/708,909  
Filing Date: March 31, 2004  
Appellant(s): KORZUN ET AL.

**MAILED**  
**JUN 26 2007**  
**Group 3700**

\_\_\_\_\_  
Daniel R. Gibson  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 21 May 2007 appealing from the Office action mailed 15 September 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,238,368	ORTOLANO	8-1993
5,215,432	PICKERING et al.	6-1993
3,702,221	ORTOLANO	11-1972
2,315,641	MOSSER	4-1943
2,277,484	FLANDERS	3-1942

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 3,702,221 (Ortolano '221 hereinafter) in view of United States Patent No. 5,215,432 (Pickering hereinafter).

Claims 1-4 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,238,368 (Ortolano '368 hereinafter) in view of United States Patent No. 2,315,641 (Mosser hereinafter), and further in view of United States Patent No. 5,215,432 (Pickering hereinafter).

Claims 5, 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 3,702,221 (Ortolano '221 hereinafter) in view of United States Patent No. 5,215,432 (Pickering hereinafter) as applied to claims 1-3 and 10-12 above, and further in view of United States Patent No. 2,277,484 (Flanders hereinafter).

Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 3,702,221 (Ortolano '221 hereinafter) in view of United States Patent No. 5,215,432 (Pickering hereinafter) as applied to claims 1-3 and 10-12 above, and further in view of United States Patent No. 2,315,641 (Mosser hereinafter).

Claims 6-9 rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 3,702,221 (Ortolano '221 hereinafter) in view of United States Patent No. 5,215,432 (Pickering hereinafter) in view of United States Patent No. 2,277,484 (Flanders hereinafter) as applied to claims 5, 14 and 18 above, and further in view of United States Patent No. 5,238,368 (Ortolano '368 hereinafter).

Claims 15-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 3,702,221 (Ortolano '221 hereinafter) in view of United States Patent No. 5,215,432 (Pickering hereinafter) as applied to claims 1-3 and 10-12 above, and further in view of United States Patent No. 5,238,368 (Ortolano '368 hereinafter).

#### **(10) Response to Argument**

***Issue I***

Appellants begin the argument section of the Appeal Brief on page 12 and generally argue that the application of 35 U.S.C. §103(a) to the claims is not proper. Specifically, Appellants believe there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. More specifically, Appellants do not believe that it would be obvious to apply an overcover used on a rotating turbine blade (rotor blade or blade, hereinafter) to a stationary turbine vane (stator vane or vane, hereinafter). Even further, Appellants still do not believe that it would be obvious to use the rotor blade overcover on a stator vane when the rotor blade overcover reference (Ortolano '221) teaches that the overcover reduces vibrational forces and stresses, specifically the tangential and axial vibrational modes and thermal bending stresses (see Ortolano '221, col. 1, lines 33-45) and the stator vane reference (Pickering) discloses that stator vanes experience stresses resulting from air flow turbulence which causes vibratory excitation of the vanes causing different modes of vibration at one or more of the natural frequencies (see Pickering, col. 1, lines 31-35).

A conventional, well-known turbine engine comprises a compressor section and a turbine section, each section comprising alternating rows of stationary vanes and rotating blades. The vanes direct the fluid flow to impinge upon the blades at a desirable angle, whereas the blades are mounted on a disk, which rotates due to the aerodynamic interaction of the airflow redirected from the vanes, and the shape of the blades. Each of the blades and vanes, since they are serially arranged in a common

flow path, are subjected to nearly identical vibrational forces due to the turbulence of the airflow. Other, *additional* forces may be present in the rotating blades since they are subjected to rotational movement which the vanes are not; however the blades and vanes are still subjected to the same vibratory forces created by the airflow turbulence.

Ortolano '221 minimizes the axial and tangential vibratory forces in blades by use of the inventive overcover (col. 1, lines 33-45). Pickering teaches vanes are subjected to vibratory stresses at their radial ends, opposite their mounting ends (col. 1, lines 10-35). Therefore, without shrouding or an overcover on the cantilevered ends of the blades and vanes, the blades and vanes experience vibrational forces caused by at least the turbulence of the airflow. The examiner believes the 35 U.S.C. §103(a) criteria argued by Appellant has been met in proving a *prima facie* case of obviousness since there is suggestion in at least Pickering to modify the Ortolano '221 overcover to be used on vanes, not just blades, since vibratory forces resulting from airflow turbulence is experienced by both blades and vanes; and further the examiner believes there is motivation in at least Ortolano '221 to use the overcover in all turbine components exposed to similar vibratory forces, not solely blades, since the overcover minimizes vibrations and prolongs the useful life of the turbine component. Clearly, other components like the turbine vanes, having a cantilevered configuration like the rotor blades, would benefit in a reduction of vibrational forces, and prolongation of useful life by using the blade overcover.

On the top of page 13 of Appellants' remarks, Appellants introduce an analogy, which equates the blade of a common household fan to turbine rotor blades, and the

casing or guard, to the turbine vanes. Appellants argue the Examiner's conclusion of obviousness is analogous to a fan blade improvement being applied to the casing or guard since they are exposed to similar conditions. The analogy proffered by Appellants seems misplaced and non-analogous itself since there is not discussed shrouding nor overcovers associated with a household fan blade and guard. Clearly, Pickering shows a platform 14 cantilevered from the mounted end of the vane, and Ortolano '221 uses the overcover on the cantilevered end of the rotor blades. While the Examiner is not well aware of problems with the useful life of a household propeller-type fan blade and the forces which cause said fan blade to fail based on at least air turbulence, it seems reasonable to apply an ingenuous improvement of the fan blade to vanes of the fan apparatus arranged serially upstream or downstream of the fan blades. However, the Examiner believes Appellants' analogy does not consider the use of vanes in a household fan, based on the absence of any vane discussion in a household fan and the limited blade guard and casing discussion on page 13, line 3; further the analogy does not consider the air currents of a household fan to be of equal relative magnitude to that of a turbine engine, rendering the analogy irrelevant to the obvious rejection made of record and applied against the pending claims.

## ***Issue II***

Next, Appellants argue later in the same paragraph on page 13 that a "spark of inventive ingenuity" is required to combine and/or modify an improvement in blades to



be used in vanes since there are structural differences. The examiner submits there is little difference between a vane and a blade for a turbine. Clearly, a vane, capable of being mounted in or on a rotor disk, or equally, a blade, capable of being mounted in or on a casing part, would still allow a turbine to operate, admittedly not as efficient as if the blade were to be mounted in or on the rotor disk and the vane were to be mounted in or on the casing part. A vane is most likely less efficient than a blade when used in a rotor disc, and similarly, a blade is most likely less efficient than a vane when used in a casing part as a flow-directing element. The structural difference is most notably the curvature of the airfoil in question. The only structural differences between a vane and a blade for a turbine as applied to the pending claims, is the use of the word "nozzle" which was only introduced after the Ortolano '221 reference was first applied on 24 April 2006. Appellants' inability to structurally distinguish a vane over a blade other than the use of the word "nozzle" preceding "blade," in the Examiner's opinion, supports the obvious conclusion that blades and vanes are inherently interchangeable since they differ little in structure, and a vane incorporating blade novel improvements would therefore have a reasonable expectation of success. Appellants' claims may broadly be considered an *intended use* of rotor blades since there seems to be no structural difference other than the use of "nozzle" when describing the blades, together with the Examiner's rebuttal above explaining that blades can be used in stators, although not as efficient as vanes.

***Issue III***

Appellants argue in the last paragraph on page 13 and further on pages 14 and 15, "that at least some of the vibratory forces to which the Examiner refers are different for nozzle blades and rotor blades." This point is not contested. Clearly rotor blade will have additional stress over blade which are stationary. The Examiner has however, identified the vibratory force caused by turbulent air as a common force in both vanes and blades. As long as the blades and vanes share a common vibratory force, it would have been obvious to apply a vibration mitigating feature of the blades to the vanes. Further, Appellants argue the blades have outward growth whereas the vanes have inward growth due to, most significantly, thermal expansion. "Inward" and "outward" are relative terms and do not structurally distinguish the blades from vanes. Respectfully submitted, vanes are conventionally attached at their "outer" ends and extend radially "inwards" toward the turbine centerline axis. Whereas, conventionally mounted blades are mounted on their "inner" ends and radially extend "outwards" away from the turbine centerline axis. Therefore, a mounted vane expands radially "inward" and a mounted blade expands radially "outward." The direction of expansion is controlled solely on whether the blade/vane is mounted at its "inner" or "outer" end. Therefore, any argument based on "outward" or "inward" expansion or directed stresses cannot be considered different, since when taken as a whole, these relative directions are in relation to the mounting configuration of the component. In other words, both the blade and vane expand radially away from their mounting feature.

***Issue IV***

The remaining arguments, labeled as B, C, D, E, and F, each argue patentability based on the same reasons as previously discussed with no further arguments presented. In as much as the previous arguments are not considered persuasive by the Examiner, the arguments labeled B, C, D, E, and F are similarly unpersuasive.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Richard A. Edgar/

Primary Examiner, Art Unit 3745

Conferees:

Eric S. Keasel



Edward K. Look

